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The technical service magazine for the rubber industry

Volume 197 No. 3 December 1987

Non-tire automotive:

- Materials for hose and tubing
- Belt design and future design objectives

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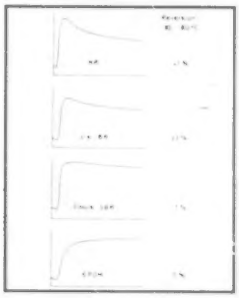

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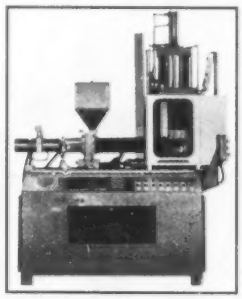

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Editorial

Thermoid Inc.'s president Robert J. Lyons uttered some sobering comments about the state of the industry when he spoke at a recent Rubber Manufacturers Association meeting. "There is not going to be any dramatic market growth in this country during the next decade. Many markets may not grow at all. So, either we are going to make it on our existing market, or we don't make it," Lyons said. "The numbers just aren't there. Many markets are mature, in fact they are suffering form old age. Many will even slip backwards. We should not be misled by the current position of the dollar and think that imported products will decline," he told the Industrial Products Division's annual gathering. At the meeting, the annual report for the division was given, showing a growth rate of 2-3%, and Lyons took exception with the figures. "I'd like to know where this growth is going to come from," he said. The traditional markets, automotive, oil, housing and construction do not appear to Lyons as areas of growth, but he and his company are not going to pack it in. He sees opportunities through all of this gloom and doom and the strategy is not revolutionary. In fact, the strategy has been forced upon many companies in the industry who have restructured their operations, mostly through threats of unfriendly takeovers. It involves controlling all costs, trimming the fat so to speak.

The theme is not new, but appears to have fallen on deaf ears in many quarters. It's a similar situation to another control that is now being practiced throughout the industry, statistical process control. SPC wasn't exactly embraced when it was first developed, in fact many in the industry felt it was forced upon them. Similarly many of the recent restructurings were forced on companies, while few recognized the advantage of being lean and mean. But just as SPC became a necessity, controlling all costs has become a necessity. Lyons said his company learned the critical importance of controlling all costs that were controllable - labor, manufacturing, marketing, sales, administrative and financing. He said they found some surprising answers, such as administrative costs and indirect labor costs far outweighed the cost of direct labor and that instead of carrying inventories for 120 days they were better off buying equipment that reduced the labor necessary to make a product.

Much of this is not popular according to Lyons but something that has to be done to remain competitive. Managers must decide where there markets are and assess the potential for growth. It may force decisions that many don't want to face. Managers can decry the government, foreign competition, labor and foreign investment as the problems, but those obstacles may be permanently in place and are items you may never totally have in control. But just as SPC has shown to be able to control the production process it is possible to control the costs that Lyons mentioned. Lyons concluded: "Once you slice away the fat and get close to the bone, you'll find it is a pretty decent way of doing business. Most important, it's a profitable, cleaner, leaner way of taking care of business until someone discovers a way to sow another crop of growth markets."

Don R. Smith
Editor

RubberWorld

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Business Briefs

Acquisitions, expansions

Mobay Corp. has agreed to acquire **Denka Chemical Corp.** pending the approval of the appropriate government agencies. Denka, headquartered in Houston, TX, is a petrochemicals manufacturer with plants in Houston, Duluth, MN and Carteret and Little Ferry, NJ. Denka manufactures polychloroprene, maleic anhydride and its derivatives and tetrahydrophthalic anhydride. Since 1984 Denka has been owned by the management and employees. The Denka group also includes **Staflex Specialty Esters**, Carteret, NJ, a plasticizer producer and **Scientific Design** of Little Ferry, NJ a producer of catalysts.

Durox Co. is tripling rubber molding capacity at its headquarters in Strongsville, OH.

Beckers Lay-Tech, a Swedish-owned company, opened a plant to manufacture acoustic and related interior trim products for the automotive industry in Springfield, TN.

Hercules Inc. opened a coatings and additives center adjacent to the company's marketing center in Wilmington, DE, to centralize the business, marketing, technical and sales staffs of the coatings and additives group.

Hydraulic Engineering Inc., Jacksonville, FL will purchase **Goodyear's Hose Couplings Manufacturing Inc.** subsidiary. HCMI has facilities in Menominee, MI and Dixon, IL.

Lonza Inc. broke ground for a multi-million dollar expansion at its specialty chemicals plant in Williamsport, PA.

Ashland Chemical acquired **Berton Plastics**, Teterboro, NJ, a distributor of glass reinforcements and unsaturated polyester resins.

ICI Fibres plans to acquire a fiber manufacturing subsidiary of **Veba Oel** located in Neumunster, West Germany.

A new Institute of Polymer Technology and Materials Engineering has been formed at **Loughborough Univeristy**, Leicestershire, England, which will be concerned primarily with postgraduate teaching and research.

Tenney Engineering, Union, NJ purchased the assets of **DynaVac**, Weymouth, MA, a manufacturer of custom thin film deposition equipment, computer-controlled optical coating systems, sputtering equipment and chemical vapor deposition systems.

Lydall, Inc. of Manchester, CT, plans to restructure the company by dividing it into two public companies, one consisting of the Fiber Materials Group and the other consisting of the Elastomers Products Group and Lydall's investment in the **CompuDyne Corp.**

RMA tire report through August
(figures in thousands of units)

Passenger tires	YTD '87	YTD '86	% change
Shipments			
original equipment	35,602	36,630	-2.81
radial	30,191	30,770	-1.88
replacement	97,243	94,498	+2.90
radial	86,858	81,329	+6.80
export	3,703	2,529	+46.42
radial	3,226	1,919	+68.11
total	136,548	133,657	+2.16
radial	120,275	114,018	+5.49
Production	110,607	104,867	+5.47
radial	96,905	88,621	+9.35
Truck & bus tires			
Shipments			
original equipment	5,265	4,643	+13.40
radial	3,656	3,087	+18.43
replacement	22,337	20,801	+7.38
radial	11,946	9,876	+20.96
export	1,285	868	+48.04
radial	909	531	+71.19
total	28,887	26,312	+9.79
radial	16,511	13,494	+22.36
Production	23,326	20,374	+14.49
radial	13,202	9,847	+34.07

Contracts, licenses

Monsanto Chemical and **Kumho Petrochemical**, Seoul, Korea have formed a joint venture to produce rubber chemicals in Korea. **Kumho Monsanto**, a 50/50 venture, will use Kumho's existing rubber chemicals plant in Yeochun as its base. It will also build a new plant to make intermediates used in antidegradant manufacturing. Plans also call for the expansion of Kumho's existing antidegradant units.

Smithers Scientific Services, Akron, OH has been designated a regional laboratory under international contract of technically specified rubbers according to the **International Rubber Association** in Malaysia. The **Rubber Research Institute of Malaysia** serves as the coordinating laboratory for the regional lab, ensuring Smithers is adequately equipped during its designated term, the length of which is determined by the IRA.

Union Carbide and **Swiss Polymers Inc.** formed a joint venture, **Elocar Co.**, to manufacture spray-dried redispersible polymer powders for the building products industry.

Whittaker Corp., Dayton Division will market cyanoacrylate and anaerobic adhesives manufactured by **Pacer Technology**.

Combustion Engineering, Stamford, CT has established a joint venture in the USSR to provide instrumentation and control products and develop software for the hydrocarbon processing industry. The venture, to be known as

Business Briefs

Applied Engineered Systems will be 49% owned by CE and 51% owned by the Soviet Union's Ministry of Oil Refining and Petrochemical Industries.

Midland Tyre & Tube Machinery, Wolverhampton, U.K. signed an agreement to manufacture and market the complete **Zelant Gazuit** range of fabric and steel bias cutters and associated equipment.

Financial statements

Ausimont reported third quarter net income of $10.5 million on sales of $176.1 million.

Park-Ohio Industries reported a net loss in the third quarter of $1.04 million. Sales totaled $31.2 million.

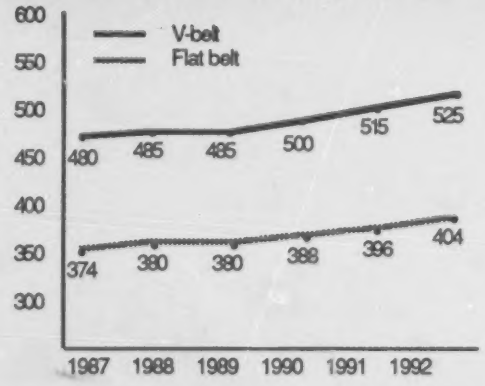
Markets, news

The Rubber Manufacturers Association's Industrial Products Division five year forecast calls for growth rates in the 2% range for hose, flat and V-belt consumption in the U.S. Hose consumption was pegged at $1.1 billion for 1987 rising to $1.3 billion in 1992; flat belting consumption will increase from $374 million to $404 million and V-belt consumption should increase to $525 million from $480 million in 1987. The division noted that imports could increase penetration of the market in all three sectors. Through July of this year, hose imports had increased 5.6%; V-belt imports increased 9.8% and conveyor belting imports were up 8.5%. Canada accounted for 43% of the imports of hose. Japan is the top exporter of V-belts, accounting for more than a third of these imports and Switzerland is the top exporter of conveyor belting to the U.S. with more than 14% of the import market.

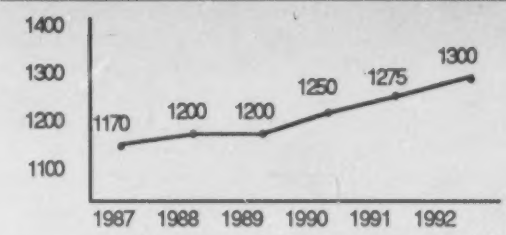
A study by Gabris International predicts that medical tubing will show the greatest increase in sales through 1991 with a growth around 18.6%. The study: *Plastics and elastomers in flexible tubing U.S. & Western Europe* shows growth also for the food and beverage market at 14.5% and the industrial market at 12.1%. Growth for flexible hose in the automotive market is slated for only a 7% increase. During this period, consumption of elastomer and plastic raw materials for flexible tubing will grow from approximately $500 million in 1986 to $640 million in 1991. The use of commodity thermoset rubber such as NBR, neoprene, epichlorhydrin and SBR will show declines in usage while NBR/PVC, CPE, CSM and silicone materials will increase. Thermoplastic elastomers will show a sharp increase in usage during the time period. Major growth will be experienced in styrenic, copolyester, olefinic and higher performance materials.

The International Natural Rubber Organization has begun selling from the buffer stock of rubber accumulated during the first International Natural Rubber Agreement. The amount to be sold is limited to what the buffer stock manager needs to finance the operations of INRO before a new agreement takes effect. INRA expired during October. The buffer stock had reached 360,000 metric tons.

RMA U.S. belt consumption forecast (millions of 1987 dollars)



RMA U.S. hose consumption forecast (millions of 1987 dollars)



Flexible hose sales estimates for U.S. and Western Europe(MM dollars)

	1986	1991	Growth
Consumer	$158.25	$175.00	10.5%
Automotive	290.00	310.50	7.0%
Industrial	484.00	543.00	12.1%
Medical	263.00	312.00	18.6%
Food & beverage	140.50	161.00	14.5%
Total	$1,335.75	$1,501.50	12.4%

Material type usage for flexible tubing

Material type	1986 demand (metric tons)	1991 forecast (metric tons)
Thermoset rubber	34,390	36,105
Thermoplastic rubber	8,085	10,768
Thermoplastic materials	226,732	248,990
Total	269,207	295,853

source: Gabris Int'l.

Automotive RIM market to grow 30% by 1990

by M.C. Cornell, Dow Chemical

Introduction

Since its commercial introduction in 1974, the Reaction Injection Molding (RIM) process has undergone significant improvements in both chemistry and equipment. These improvements have substantially reduced the cost and improved the quality of RIM parts. RIM is thus increasingly utilized by original equipment manufacturers to produce exterior automotive components; especially when large size, high surface quality, and/or part complexity are required. Additional mechanical and chemical improvements are under development which will further enhance the economic viability of RIM over alternate processes.

The improvements in RIM chemistry include the industry's conversion of chain extenders from glycols to diethyltoluenediamine (DETDA) for fascia, the commercial adoption of internal mold release (IMR) in these fascia, the development of polyurea chemistry for both fascia and body panels, and the use of glycol extended RIM systems for modular windows.

Truly structural RIM (MMRIM) parts are now in production because of the development of low viscosity, delayed gel isocyanurate and urethane chemistries which allow wet-out of preform reinforcements. While not yet capable of providing a "Class A" surface, large MMRIM parts are being considered for services as, for example, pickup truck box beds and bumper beams.

Automotive RIM markets

The North American automotive RIM market (for definition, RIM is considered to be the closed mold molding of high density [greater than about 0.7 specific gravity] articles from reactive liquids mixed by high pressure impingement; low density integral skin parts like steering wheels are not included) in 1987, estimated to be 61,000 metric tons (134 million pounds), reflects the increasing acceptance of RIM (table 1). This market is dominated by its use in flexible fascia, with use in body panels so far restricted to the Pontiac Fiero and Chevrolet Corvette. MMRIM has also found its first commercial application as spare tire covers for General Motors vehicles.

Table 1 - automotive RIM market in North America

Application	1987 M-MTPA	1990 M-MTPA
Fascia	51.0	70.0
Trim	2.0	6.0
Body panels	1.0	3.0
Modular windows	5.5	10.0
MMRIM	1.5	3.0
Total	61.0	92.0

The most significant new automotive application of RIM is its use to mold gaskets in situ for modular window units (ref. 1). From initial production in 1984, modular window molding via RIM has grown as projected to exceed 5,500 metric tons (12 million pounds) annually.

Table 2 - global automotive RIM market

Region	M-MTPA
North America	61
Japan	22
Europe	19
(Fascia, 7 M-MTPA)	
(Trim, 12 M-MTPA)	
Other	4
Total	106

The North American RIM market is approximately 57% of a global consumption of RIM chemicals estimated to be 106,000 metric tons (233 million pounds), with Japan having the next largest use of the RIM process (table 2).

RIM use in Japan has been dominated by the production of polyurethane fascia, which have been selected over other materials because of proven high quality in complex parts. Japanese use of RIM in body panels, structural composites and modular windows is being explored for future vehicles.

Europe has been more conservative in its use of RIM fascia; due, in part, to the diversity of impact requirements, styling and market expectations. Existing RIM dispensing equipment has traditionally been designed for relatively low delivery rate, matching the reactivity of initial RIM chemistry based on glycol chain extension. This low output equipment restricts the use of higher reactive but more productive chemistry. The European tendency is to use RIM for lower volume specialty applications such as body side moldings, wheel arches and air dams (front spoilers).

By 1990 the North American RIM market is projected to grow to 92,000 metric tons (202 million pounds), due primarily to growth in both the size and number of RIM fascia produced and to the planned increased use of RIM modular windows (table 1). A significant aspect of this growth is the captive RIM fascia production by Japanese auto manufacturers to supply their new North American operations. The selection of the RIM process over injection molding is a reflection of both the higher quality and economic benefits of advance RIM technology.

An increased use of RIM in trim parts, following the European tradition, is emerging in the United States and Canada. Because such trim parts provide desired styling differentiation, this application is expected to grow in the 1990s.

Little growth is forecast for RIM body panels or MMRIM through 1990 in North America. The only committed new program is the General Motors "GM-200" minivan (1990 model year) which has specified polyurea RRIM

fenders (ref. 2). Other body panel programs under development are targeted for commercialization in the early-to-mid 1990s.

Future growth in RIM production outside of North America is more difficult to quantify because few new applications are publicly committed. However, certain trends are noteworthy:

1. In Japan, both custom and captive RIM producers are qualifying state-of-the-art RIM fascia chemistry based on DETDA and IMR. In some cases this chemistry will first be used to mold fascia at affiliates in the United States using advanced, high output, dispensing equipment. Plant expansion in Japan is then planned to use both this advanced chemistry and equipment.

2. While only one modular window program is committed by a Japanese automobile manufacturer, several development programs are in progress. The same scenario exists in Europe, where a modular window set is being produced for Fiat. Other European auto glass manufacturers have modular window prototyping programs in progress with several automobile companies.

3. New RIM plants in Korea and Brazil have begun production of bumpers and fascia to serve their domestic market and to export to North America.

4. As in North America, RIM body panels and MMRIM composites are being examined for use in the 1990s.

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1. Carswell, R. and P. J. Kubizne. "Polyurethane RIM Modular Windows - A Synergistic Combination of Polymer, Process and Application," 29th Annual Technical/ Marketing Conference, Polyurethane Division, The Society of Plastics Industry, Reno, Nevada (October 23-25, 1985).

2. Vanderhinder, J. A. "Polyurea RIM Body Panels for On-Line Painting," Polyurethanes World Congress 1987, Aachen, West Germany (9/29-10/2, 1987).

SPI Poyurethane Division issues paper call

The Polyurethane Division of the Society of the Plastics Industry, Inc., has announced a "Call for Papers" for its 31st Annual Polyurethane Conference, being held October 18-21, 1988, in Philadelphia, Pa., at the Wyndham Franklin Plaza Hotel.

The Polyurethane Division will consider papers that address all phases of flexible foams, elastomers and RIM, and encourages papers that emphasize marketing or possible end-use applications of polyurethane technologies.

Suppliers, manufacturers, customers and end-users of polyurethane materials, products, machinery or equipment are invited to submit abstracts of proposed papers by February 11, 1987.

"We're introducing an exciting new aspect of the conference next year consisting of concurrent marketing and management sessions," said Jim Giroux, Communications Committee chairman.

These sessions will cover such areas as advertising, direct mail, telemarketing, public relations, special events, employee relations, legal issues, quality management, productivity, strategic planning and customer service.

"The Polyurethane Division encourages persons or organizations willing to share their expertise in any of these marketing and management areas to submit a description of a successful plan or project," Giroux added.

As it has in the past, the conference will provide an international forum for exchanging the latest information on chemical and technical innovations and on environmental issues of interest to the polyurethane industry.

To receive a form to submit an abstract of a proposed paper, or to obtain more information on next year's conference, contact Fran Lichtenberg at: Polyurethane Division, The Society of the Plastics Industry, Inc., 355 Lexington Avenue, New York, NY 10017; (212) 351-425.

PMA has speakers available for cast polyurethane elastomer presentations

The Polyurethane Manufacturers Association (PMA) has announced the availability of spokesmen to address various groups on the advantages of custom-molded polyurethane as a problem-solving alternative to conventional materials such as metal, wood, rubber and plastics in a variety of applications.

Targets of PMA's Speakers Bureau program include engineering societies, corporations, military groups, colleges, universities and other technical groups interested in increasing their knowledge of the unique properties and applications available through the use of polyurethane.

The Speakers Bureau is part of PMA's 5-part marketing drive which includes: 1) distribution of PMA's new "Polyurethane Applications Guide," a folder of information on polyurethane advantages and applications, including case histories and a list of PMA member company contacts; 2) an association advertising program aimed at engineers; 3) member company coordination of ads with the PMA program; and 4) a publicity service for distribution of PMA member company news releases through the Association's headquarters.

To schedule Speakers Bureau engagements, please contact the PMA office: Building C, Suite 20, 800 Roosevelt Road, Glen Ellyn, IL 60137; 312/858-2670.

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